FROM BANNER 8 TO BANNER XE

What’s the story?
BANNER XE = EXTENSIBLE ECOSYSTEM
Banner powered by XE is the solution

**The Products**
- Web 2.0 user experience
- Common look and feel across applications
- Enhanced features

**The Workforce**
- Accommodation of generational users
- Improved usability
- Better access to information

**The Technology**
- Standards-based, open, and modern technology
- Reduced upkeep of customizations
- Evolutionary path from Banner 8.x
CHANGE FROM BANNER 8 TO BANNER XE

“The secret of change is to focus all of your energy, not on fighting the old, but on building the new.”

— Socrates
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Addresses & Phones
E-mail Addresses
Emergency Contacts
Name Change Information
Social Security Number Change Information

RELEASE: B.6
BANNER XE
### My Profile

#### My Personal Information

<table>
<thead>
<tr>
<th>Address</th>
<th>School Campus</th>
<th>W2 Address</th>
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</table>
| Mailing  
1074 Berkley Street  
MEDIA  
Chester  
Pennsylvania 19015 | 4461 Centennial Farm Road  
MEDIA  
Chester  
Pennsylvania 19015 | 3391 Nazum Court  
MEDIA  
Chester  
Pennsylvania 19015 |

#### Phone

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#### Email

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#### Emergency Contacts

- **Spouse**: Ronald Anderson  
3391 Nazum Court  
MEDIA  
Pennsylvania 19015  
215-639-0004

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**BANNER XE**
BANNER XE AT THE UNIVERSITY OF ILLINOIS
- Catalog and Schedule (2012)
- Faculty Grade Entry (September 2014)
EXPECTATIONS VS. REALITY
FUTURE XE MODULES

- Advising Student Profile
- Events Management
- Student Registration
- Employee Profile
- Finance Self-Service Purchase Requisition
ACCELERATED XE DELIVERY

- Financial Aid
- Finance
- Human Resources
- Student
ACCELERATED DELIVERY
## BANNER STUDENT

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HOW ARE WE INVOLVED?
DEVELOPMENT PARTNER GROUPS

- Academic History
- Student Registration
- Employee Profile
- Finance Self-Service Purchase Requisition
The Pain

- Tell us more about the pain
- Give specifics
- Provide examples
- Have you tried anything to solve?...and did that work?

The Reason

- What caused this?
- How long has this been a problem?

Impact

- How does this impact productivity?
- How do the users feel about this?
- How much is this costing you?

The funnel gets us to user stories and user stories will help define the scope.
ACCESSIBILITY
BANNER XE TECHNOLOGY

XE Architecture
- Banner Administrative Forms (9-5 folks)
- Built on Oracle Forms technology
- Been around since 1985
- Client/Server architecture converted to the web 15 yrs ago along with requiring the client-side Java (ouch!!!)
ORACLE LEGACY ARCHITECTURE (CONT..)

- Banner Self Service (registration, admissions, employee profile, etc…)
- Built on Oracle Web Toolkit (i.e. db packages converted to html and sent back to AS)
- Extremely efficient but user interface a little boring
Per 2013 Kaspersky report*, 90.52% of all detected attempts to exploit vulnerabilities targeted Oracle Java.

- Written in **groovy** (yes groovy)
- Agile/dynamic language compiles down to java and deployed to a JVM
- Contains additional powerful features introduced in Python, Ruby and Smalltalk
- Much more efficient to code than Java

```java
for (String it : new String[] {"Rod", "Carlos", "Chris"})
    if (it.length() <= 4)
        System.out.println(it);
```

```groovy
["Rod", "Carlos", "Chris"].findAll{it.size() <= 4}.each{println it}
```
Grails - open source java web framework (grails.org)

- Designed for high productivity - convention over configuration (no xml config files)
- Uses the groovy language
- Incorporates existing java technologies like Hibernate and Spring
XE uses common web 2.0 user experience

Uses standards based, open source, modern technologies

Will coexist alongside Banner 8 during the transition

Modularized to eliminate larger system dependencies and be more plug and play
Oracle Database stays the same from Banner 8 to Banner XE

BANNER 8 VS BANNER XE ARCH
- **Banner 8 Skills**
  - Banner Forms – IDE Forms Developer Suite/PLSQL
  - Banner Self Service – PLSQL, HTML, CSS, JavaScript
- **Banner XE Skills**
  - Groovy/Java/Grails framework/JEE Framework
  - HTML5, CSS, JavaScript, PLSQL
  - IDE IntelliJ w/ grails plugin (could also use eclipse or good old fashioned text editor)
  - Git version control

**BANNER XE TOOLS OF THE TRADE**
- All major browsers – Chrome, Internet Explorer 9, 10, and 11 (Windows 7), Safari 5.x, Firefox
- Chrome compatibility mode disabled
- IE compatibility view disabled
- NO Java Plug-In needed (makes security guys happy) or other client software
- Tablet support – Ipad iOS 7.x+, Ipad Mini, Android OS 4.x, Microsoft Surface 1.0, RT and PRO
XE currently supported out of the box with CAS (JASIG)

We use EAS (.. Future SiteMinder)

All XE products WILL support common industry standards (i.e. SAML2)

Institutions will be free to choose ID management solution of their choice (i.e. SiteMinder)

Ellucian will test with industry common commercial IDM solutions
BANNER XE TECHNOLOGY

Extensibility of XE
GREATER EXTENSIBILITY IN BANNER XE

“ability of a software system to allow and accept significant extension of its capabilities, without major rewriting of code or changes in its basic architecture”

- **Banner 8**
  - Lacking in extensibility (91 local mods on the system)
  - Modifications required where customization leaves off
  - Were paying $800K/year to Ellucian for customizations - now supported in house

- **Banner XE**
  - Provides additional levels of customization
  - Adds the ability to extend applications
  - Reduces the need to modify applications

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GREATER EXTENSIBILITY IN BANNER XE

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XE MODIFICATION WORKFLOW

1. Setup origin git repo and clone from Ellucian
2. Checkout to dev workstation with git
3. Make changes, test, and push to git origin
4. XE admin checkout from origin
5. Build and deploy to XE app server

... If you must modify source code then

XE MODIFICATION WORKFLOW
BANNER XE TECHNOLOGY

Application Programming Interface (API)
Strategic focus is to expose APIs that adhere to REST (REpresentational state transfer over HTTP) principles whenever possible.

RESTful APIs exposed as new applications are built and functionality is added.

Included with baseline functionality alongside Banner modules (i.e., when we install registration XE, we get the corresponding registration APIs).

Previously had to go into database and call PLSQL API or write intermediary application or use/extend existing messaging infrastructure.
• Catalog of API (REST calls)
• Updated/expanded with releases
Fee Assessment for student

**Request:**

```
POST /api/registration-fee-assessment?bannerId={bannerId}&term={term} HTTP/1.1
```

**Response:**

```
[
    {
        "feeAmount": 200,
        "feeDetailCode": "LAB1",
        "feeDetailDescription": "Lab Fee"
    },
    {
        "feeAmount": 3500,
        "feeDetailCode": "THFA",
        "feeDetailDescription": "Horizon Tuition"
    }
]
```
BANNER XE TECHNOLOGY

Performance Testing
Performance/load testing big part of what we do
Standard part of the upgrade cycles using Rational Performance Tester
Registration Fall/Spring Start of Term heaviest processing from system point of view
System has been very stable and performed for a number of years (99.99% availability excluding planned outages FY14)
Number of tuning fixes have been implemented over time as a direct result of performance testing
Performance Test XE Registration Controlled Release I (i.e. early adopter release)

Goals

- Achieve similar/better perf than Banner 8 under peak load
- Achieve acceptable perf with advanced searching

Test(s) design

<table>
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<tr>
<th>Test</th>
<th>Concurrent Users</th>
<th>Total Users</th>
<th># of Registrations</th>
<th>Notes</th>
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<tbody>
<tr>
<td>Banner 8/XE comp</td>
<td>500</td>
<td>2000</td>
<td>10000</td>
<td>3/4 users register by entering CRN, 1/4 users register by searching</td>
</tr>
<tr>
<td>XE advanced searching</td>
<td>500</td>
<td>2000</td>
<td>10000</td>
<td>All users do advanced searching, 2/5 search on simple subject, 3/5 search on (time of day, honors, online, etc..)</td>
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</tbody>
</table>
- Initial 20 user test (4 passed/16 failed). Ugh!!
- ... many iterations, modifications later - Success!!
- All users passed/registered/didn’t bring system to knees
- Avg timings slower on XE albeit acceptable (XE pages have more content, images, etc.)
- Much of the processing shifts from DB in 8 to App Server in XE
TUNING ENHANCEMENTS

- Architecture – before/after
  
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<th># App Servers</th>
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<td>OFM 11.1.1.6</td>
<td>2</td>
<td>6GB</td>
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Database Server

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<td>After</td>
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<td>96GB</td>
<td>Oracle 11.2.0.4 (with bug fix 17242746)</td>
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- Enable jdbc caching on app server
- Modifications to Banner source code to reduce SQL traffic
- Increase jdbc conn pool and initialize connections up front
XE requires significantly more middleware/memory than its Banner 8 counterpart. (i.e. Student app essentially broken into 23 modules/apps now)

Big learning curve on the new Groovy/Grails architecture. Existing java knowledge eases this transition.

Version 1.0 of new application/will need to be patient with vendor during process

Have gotten good and efficient at existing processes supporting Banner past 10 years, these will need to be adjusted now
BANNER XE DEMO – FACULTY GRADE ENTRY
QUESTIONS?
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Beth McCarter, AITS, emason@uillinois.edu
Brian Schoudel, AITS, brians@uillinois.edu

THANK YOU!!